

**REMARKS**

This is a reply to the Office Action mailed March 12, 2003, with a shortened statutory response period of three (3) months from the mailing date extended two months by Petition filed herewith. The Commissioner is hereby authorized to charge any additional fees to Deposit Account number 02-1818.

Applicants respectfully request reconsideration and allowance of the pending claims in view of the Amendments and Remarks below.

A. Status of the Application

Claims 1-60 are pending in this application and stand rejected. Applicants respectfully traverse these rejections for the reasons set forth below.

B. Drawings

Applicants have attached a corrected set of drawings which include the missing reference numerals as requested by the Examiner.

C. Summary of the Rejections

The following table summarizes the Examiner's rejection by claim and paragraph number in the first office action.

Claim	4-6	7-11	12-14	15-17	19-22	23-24	25-26	27-28	29-30
1	x	x	x	x					
2	x	x	x	x					
3	x	x	x	x					
4		x	x	x					
5		x	x	x					
6	x	x	x	x					
7	x	x	x	x					
8	x	x	x	x					
9	x	x	x						
10	x	x		x	x				
11						x	x	x	x
12						x	x	x	x
13						x	x	x	x
14	x	x		x	x				
15	x	x		x	x				

Claim	4-6	7-11	12-14	15-17	19-22	23-24	25-26	27-28	29-30
16	x			x	x				
17	x	x		x	x				
18				x	x				
19				x	x				
20					x				
21				x	x				
22								x	x
23								x	x
24								x	x
25				x	x				
26				x	x				
27				x	x				
28				x	x				
29				x	x				
30				x	x				
31					x				
32								x	x
33								x	x
34								x	x
35				x	x				
36				x	x				
37				x	x				
38				x	x				
39				x	x				
40				x	x				
41					x				
42								x	x
43								x	x
44								x	x
45				x	x				
46	x	x		x					
47	x	x		x					
48	x	x							
49	x	x		x					
50						x	x	x	x
51						x	x	x	x
52						x	x	x	x
53	x			x					
54	x	x		x					
55	x			x					
56	x	x		x					
57		x		x					

Claim	4-6	7-11	12-14	15-17	19-22	23-24	25-26	27-28	29-30
58		x		x					
59	x	x		x					
60	x	x		x					

The basis for the Examiner's rejections are as follows:

- Paragraphs 4-7 rejects the above-identified claims under 35 U.S.C. 102 (b) in view of *Rosenbaum*.
- Paragraphs 7-11 rejects the above-identified claims under 35 U.S.C. 102 (e) in view of *Piper*.
- Paragraphs 12-14 rejects the above-identified claims under 35 U.S.C. 102 (e) in view of *Shang*.
- Paragraphs 15-17 rejects the above-identified claims under 35 U.S.C. 102 (e) in view of *Small*.
- Paragraphs 19-22 rejects the above-identified claims under 35 U.S.C. 103 in view of the combination of *Shang* and *Small*.
- Paragraphs 23-24 rejects the above-identified claims under 35 U.S.C. 103 in view of the combination of *Rosenbaum* and *Adur*.
- Paragraphs 25-26 rejects the above-identified claims under 35 U.S.C. 103 in view of the combination of *Piper* and *Adur*.
- Paragraphs 27-28 rejects the above-identified claims under 35 U.S.C. 103 in view of the combination of *Small* and *Adur*.
- Paragraphs 29-30 rejects the above-identified claims under 35 U.S.C. 103 in view of the combination of *Shang*, *Small* and *Adur*.

D. Discussion of the Cited Art

*Rosenbaum* discloses a multiple layer film having a skin layer of a polypropylene (PP), a core layer of a blend of a PP, a polyethylene (PE) and a styrene and hydrocarbon copolymer

(SEBS) and a RF susceptible layer of a polymer blend PP, PE, SEBS and a polyamide (PA). The film can be fabricated into medical containers capable of being autoclaved to terminally sterilize the container.

*Piper* discloses a multiple layer film having outer layer of a PP that can be blended with a polyester (Pest) and a second layer of an ethylene alpha-olefin copolymer. There is no disclosure of having an outer layer of Pest by itself and not blended with a PP type resin. *Piper* further discloses the multiple layer films can also utilize tie layers as needed.

*Shang* discloses an autoclavable polymer film and containers made therefrom. A seal layer of *Shang* is a blend of a cross-linkable component such as PE and a non-cross-linkable component such as PP. The seal layer can be attached to numerous other layers such as a Pest or a PA. The film is subject to radiation to cross-link the cross-linkable component of the seal layer so the film can withstand the temperatures reached during steam sterilization. *Shang* is commonly assigned to the present Applicant, and, therefore, cannot be used in rejections under 35 U.S.C. 103.

*Small* discloses a multiple layered film capable of being sterilized by autoclaving. The *Small* film has an outer layer of an ethylene alpha-olefin copolymer having a density of less than about 0.916 g/cc and a melting peak temperature greater than 118°C determined using a differential scanning calorimeter process. The *Small* film has a second exterior layer of a Pest, PA, copolyester or a polyolefin.

*Adur* discloses a polymer adhesive of a blend of (a) a graft copolymer of a polyethylene backbone grafted at least one grafting monomer comprising one or more polymerizable ethylenically unsaturated carboxylic acids or acid derivatives such as acid anhydrides and (b) a LDPE, LLDPE and (c) a poly (alpha-olefin).

E. Reply to Rejections

a. Paragraph 4-7 rejections

Independent claims 1 and 46 have been rejected in view of *Rosenbaum*. Claims 1 and 46 have been amended to state the second layer is "consisting essentially of" a ethylene alpha-olefin

copolymer. The consisting essentially of is meant to exclude components that would have a material impact on the second layer alone. The inclusion of components such as PP, PA, SEBS in the amounts specified by *Rosenbaum* will have a material impact on the physical properties of the second layer. Accordingly, *Rosenbaum* does not disclose using such a layer in its film. Thus, *Rosenbaum* does not anticipate the rejected claims identified in the table above.

b. Paragraph 8-11 rejections

Independent claim 1 and 46 have been rejected as being anticipated in view of *Piper*. *Piper* does not disclose an outer layer consisting essentially of a Pest or PA. *Piper* merely discloses the Pest as a blending component with another component such as PP. The inclusion of an additional component of a PP will materially impact the physical properties of the film. Thus, *Piper* does not anticipate the claims identified in the table above.

c. Paragraph 12-14 rejections

Independent claims 1, 18, 28, 39 and 46 have been rejected in view of *Shang*. *Shang* requires its seal layer contain a PE blended with a polymer such as PP or others.

*Shang* does not disclose a polymer layer consisting essentially of an ethylene alpha-olefin copolymer. Thus, *Shang* does not anticipate the claims identified in the table above.

d. Paragraph 15-17 rejections

Independent claims 1, 18, 28, 39 and 46 have been rejected in view of *Small*. *Small* does not disclose using an ethylene alpha-olefin having a DSC peak melting point temperature of 100°C or lower. Thus, *Small* does not anticipate the rejected claims identified in the table above.

e. Paragraph 19-22 rejections

Applicants assert the combination of *Shang* and *Small* is not proper. *Shang* is identified as prior art under 35 U.S.C. 102(e). Applicant is the assignee of *Shang*. Accordingly, *Shang* cannot be combined with *Small* for the reasons set forth in 35 U.S.C. 103(c). Therefore, Applicants respectfully request a withdrawal of this rejection.

f. Paragraph 23-24 rejections

Because *Rosenbaum* fails to disclose a layer consisting essentially of an ethylene alpha-olefin copolymer and in fact teaches away from such a layer by requiring polymer blends containing such PE polymers, the Examiner has failed to present a prima facie case of obviousness for the claims identified in the table above.

g. Paragraph 25-26 rejections

Because *Piper* teaches away from a layer consisting essentially of a Pest or PA by disclosing blending Pest with a PP or other polymer any combination with *Piper* fails to present a prima facie case of obviousness for the claims identified in the table above.

h. Paragraphs 27-28 rejections

Because *Small* teaches away from using a ethylene alpha-olefin copolymer having a DSC melting point of 100°C or less by teaching the use of ethylene alpha-olefin copolymers having a melting point determined using a DSC process of 118°C or higher.

Support for amending the claims to recite a DSC melting point of 100°C or less is based on the following. At page 4, lines 15-16, Applicants disclose using Affinity and Exact polymers. The attached data sheets for representative Affinity and Exact polymers show that the DSC melting point temperatures for such polymers are from as high as 100°C (Affinity PL 1881) to as low as 55°C (Affinity EG 8100).

i. Paragraphs 29-30 rejections

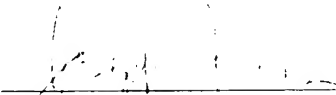
Applicants assert the combination of *Shang*, *Small* and *Adur* is not proper. *Shang* is identified as prior art under 35 U.S.C. 102 (c). Applicant is the assignee of *Shang*. Accordingly, *Shang* cannot be combined with *Small* for the reasons set forth in 35 U.S.C. 103 (c). Therefore, Applicants respectfully request a withdrawal of this rejection.

**CONCLUSION**

In view of the foregoing amendments and remarks, Applicants submit that none of the references alone anticipate the claims as amended and that none of the references alone or in combination render the claims as amended obvious. Applicants submit the claims are in a condition for allowance and respectfully request an early notice of the same.

Respectfully submitted,  
BELL, BOYD & LLOYD LLC

Date: August 12, 2003

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**Dow Plastics**

# AFFINITY EG 8100

## Polyolefin Plastomer for General Plastomeric Applications

- General purpose plastomer
- Excellent impact properties in blends with polypropylene and polyethylene
- Highly flexible with good elastic recovery
- High clarity
- Breathable (high O<sub>2</sub> and CO<sub>2</sub> transmission rates)
- Low temperature sealability
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* EG 8100 Polyolefin Plastomer for General Plastomeric Applications is produced via INSITE\* Technology from Dow Plastics\*. It is a general

purpose ethylene-octene copolymer exhibiting high flexibility and elasticity. AFFINITY EG 8100 can be utilized in monolayer and

coextruded films and in blends with other polyolefins to enhance clarity, sealability and toughness of the structure.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.0
Density, g/cc	ASTM D 792	0.870
Mooney Viscosity, ML 1+4 @ 121°C	ASTM D 1646	23.6
Melt Flow Ratio, I <sub>10</sub> /I <sub>2</sub>	ASTM D 1238	7.6
DSC Melting Point, °F (°C)	Dow Method	131 (55)
Vicat Softening Point, °F (°C)	ASTM D 1525	109 (43)
<b>Mechanical Properties<sup>(3)</sup></b>		
Average Hardness, Shore A	ASTM D 2240	74
Tensile Modulus, 100% Secant, psi (MPa)	ASTM D 638	887 (6)
Tensile Yield, psi (MPa)	ASTM D 638	248 (2)
Ultimate Tensile, psi (MPa)	ASTM D 638	1537 (11)
Ultimate Elongation, %	ASTM D 638	1115

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) All tests performed on compression molded samples.

-See "Handling Considerations" attached

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**Dow Plastics**

# AFFINITY EG 8150

## Polyolefin Plastomer for General Plastomeric Applications

- High elasticity with low permanent set
- Superior impact properties in blends with polypropylene and polyethylene
- High clarity
- Good irradiation-sterilization stability
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details<sup>(1)</sup>

AFFINITY\* EG 8150 Polyolefin Plastomer for General Plastomeric Applications is produced via INSITE\* Technology from Dow Plastics\*. This general-

purpose ethylene alpha-olefin copolymer exhibiting high flexibility and elasticity. It can be utilized in monolayer and coextruded films and in blends

with other polyolefins to enhance clarity, sealability and toughness of the structure.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	0.50
Density, g/cc	ASTM D 792	0.8680
Mooney Viscosity, ML 1+4 @ 121°C	ASTM D 1646	37
Melt Flow Ratio, I <sub>10</sub> /I <sub>2</sub>	ASTM D 1238	7.6
DSC Melting Point, °F (°C)	Dow Method	133 (56)
Vicat Softening Point, °F (°C)	ASTM D 1525	<113 (<45)
<b>Mechanical Properties<sup>(3)</sup></b>		
Average Hardness, Shore A	ASTM D 2240	72
Tensile Modulus, 100% Secant, psi (MPa)	ASTM D 638	960 (6.6)
Tensile Yield, psi (MPa)	ASTM D 638	215 (1.5)
Ultimate Tensile, psi (MPa)	ASTM D 638	1300 (8.9)
Ultimate Elongation, %	ASTM D 638	>1000

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) All tests performed on compression molded samples.

-See "Handling Considerations" attached



**Dow Plastics**

# AFFINITY EG 8185

## Polyolefin Plastomer

- Elastic fibers
- Lower density polyolefin plastomer
- Elastic performance
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* EG 8185 Polyolefin  
Plastomer (POP) is produced

via INSITE\* Technology from  
Dow Plastics†. It is a lower

density POP polymer exhibiting  
high elasticity for fibers.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	30
Density, g/cc	ASTM D 792	0.8850
DSC Melting Point, °F (°C)	Dow Method	181 (83)

(1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.

(2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.

-See "Handling Considerations" attached

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**Dow Plastics**

# AFFINITY EG 8200

## Polyolefin Plastomer for General Plastomeric Applications

- General purpose plastomer
- Excellent impact properties in blends with polypropylene and polyethylene
- Excellent flow characteristics
- Highly flexible with good elastic recovery
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* EG 8200 Polyolefin Plastomer for General Plastomeric Applications is produced via INSITE\* Technology from Dow

Plastics\*. This is an ethylene alpha-olefin copolymer exhibiting high flexibility and elasticity. It can be utilized in monolayer cast film

and in blends with other polyolefins to enhance clarity, sealability and toughness of structure.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	5.00
Density, g/cc	ASTM D 792	0.870
Mooney Viscosity, ML 1+4 @ 121°C	ASTM D 1646	8
Melt Flow Ratio, I <sub>10</sub> /I <sub>2</sub>	ASTM D 1238	7.5
DSC Melting Point, °F (°C)	Dow Method	145 (63)
Vicat Softening Point, °F (°C)	ASTM D 1525	<113 (<45)
<b>Mechanical Properties<sup>(3)</sup></b>		
Average Hardness, Shore A	ASTM D 2240	70
Tensile Modulus, 100% Secant, psi (MPa)	ASTM D 638	600 (4)
Tensile Yield, psi (MPa)	ASTM D 638	230 (2)
Ultimate Tensile, psi (MPa)	ASTM D 638	900 (6)
Ultimate Elongation, %	ASTM D 638	>1000

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) All tests performed on compression molded samples.

-See "Handling Considerations" attached

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**Dow Plastics**

# AFFINITY KC 8852

## Polyolefin Plastomer

- Excellent inherent cling properties
- Excellent optical properties
- Excellent toughness properties
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* KC 8852 Polyolefin Plastomer (POP) is produced via INSITE\* Technology from Dow Plastics<sup>†</sup>. This resin is an ethylene-octene copolymer that offers excellent performance as a cling resin in one-sided stretch cling film applications. This polyolefin

plastomer provides excellent cling and optics, while offering outstanding toughness.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	3.0
Density, g/cc	ASTM D 792	0.8750
DSC Melting Point, °F(°C)	Dow Method	155 (68)
<b>Cast Film Properties<sup>(3)</sup> .8 mil (20 µm)</b>		
Unstretched Cling, g	ASTM D 4649	250
200% Stretched Cling, g	ASTM D 4649	125
Gloss, 45°	ASTM D 2457	66
Haze, %	ASTM D 1003	4.3
Dart Impact, g	ASTM D 1709	150
Puncture Resistance, ft-lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	190 (16)
<b>Blown Film Properties<sup>(3)</sup> .8 mil (20 µm)</b>		
Unstretched Cling, g	ASTM D 4649	145
200% Stretched Cling, g	ASTM D 4649	110

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) The resin was utilized as the cling layer in coextruded cast and blown 0.8 mil (21 µm), one-sided stretch cling film structures.

-See "Handling Considerations" attached

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# AFFINITY PF 1140

## Polyolefin Plastomer for Packaging Films

- High performance blown film resin for flexible packaging
- Excellent abuse resistance
- Low temperature seal initiation
- Excellent optics
- Outstanding high oxygen transmission rates
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* PF 1140 Polyolefin Plastomer (POP) for Packaging Films is produced via INSITE\* Technology from Dow Plastics†. It is an ethylene alpha-olefin

resin designed to be used in a variety of demanding applications including form-fill-seal packaging and fresh produce bags. This resin has

excellent compatibility with other polyolefins, allowing efficient blending and coextrusion.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.60
Density, g/cc	ASTM D 792	0.8965
DSC Melting Point, °F (°C)	Dow Method	205 (96)
Vicat Softening Point, °F (°C)	ASTM D 1525	170 (77)
<b>Film Properties, 2.0 mil (51 µm)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	245 (20)
Energy, in·lbf (J)		72.4 (8)
Force, lbf (N)		18.8 (83)
Dart Impact (Method B), g	ASTM D 1709	>850
Elmendorf Tear <sup>(3)</sup> , g	MD	470
	CD	620
Tensile Yield, psi (MPa)	MD	840 (5.8)
	CD	920 (6.3)
Ultimate Tensile, psi (MPa)	MD	7290 (50)
	CD	5730 (40)
Ultimate Elongation, %	MD	690
	CD	700
Tensile Modulus, 2% Secant, psi (MPa)	MD	10560 (73)
	CD	10610 (73)
Clarity	ASTM D 1746	70
Gloss, 20°	ASTM D 2457	134
Haze, %	ASTM D 1003	1.3
Seal Initiation Temperature <sup>(4)(5)</sup> , °F (°C)	Dow Method	178 (81)

### Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Type: Single Flight Double Mix
- Die Gap: 70mil (1.8 mm)
- Melt Temperature: 408°F (209°C)
- Output: 6 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 50 rpm
- Frost Line Height: 25 in. (635 mm)

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) Modified rectangular test specimen.
- (4) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (5) Heat Seal Strengths, Topwave HT Tester 0.5 S dwell, 40 psi bar pressure, pull speed 10 in./min (250 mm/sec).

-See "Handling Considerations" attached

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# AFFINITY PF 1146

## Polyolefin Plastomer for Packaging Films

- For use as a sealant layer in multilayer films
- For fresh-cut produce, dry foods and other high speed VFFS (Vertical Form-Fill-Seal) applications
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a. Consult the regulations for complete details.

Slip Additive: 3500 ppm  
Antiblock Additive: 6000 ppm

AFFINITY\* PF 1146 Polyolefin Plastomer (POP) for Packaging Films is designed for high speed packaging applications requiring low seal initiation temperature and good machinability (low consistent

coefficient of friction and low block force). This resin is designed to give a COF of  $\leq 0.2$  for an ~1.0 mil sealant layer in a coextruded film, and to run fast

and trouble-free on most extrusion equipment, including blown film dies equipped with narrow die gaps.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.00
Density, g/cc	ASTM D 792	0.8996
DSC Melting Point, °F (°C)	Dow Method	203 (95)
Vicat Softening Point, °F (°C)	ASTM D 1525	169 (76)
<b>Film Properties, 2.0 mil (51 µm)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	116 (10)
Energy, in·lbf (J)		31.5 (4)
Force, lbf (N)		11.0 (1)
Elmendorf Tear, g	MD ASTM D 1922	378
	CD	461
Tensile Yield, psi (MPa)	MD ASTM D 882	933 (6)
	CD	868 (6)
Ultimate Tensile, psi (MPa)	MD ASTM D 882	5410 (37)
	CD	6109 (42)
Ultimate Elongation, %	MD ASTM D 882	554
	CD	602
Tensile Modulus, 2% Secant, psi (MPa)	MD ASTM D 882	7421 (51)
	CD	7970 (55)
Clarity	ASTM D 1746 <sup>(2)</sup>	90
Gloss, 45°	ASTM D 2457	77
Haze, %	ASTM D 1003	5.5
Seal Initiation Temperature <sup>(3)(4)</sup> , °F (°C)	Dow Method	167 (75)

### Fabrication Conditions For Blown Film:

- Screw Type: Modified LDPE or moderate-work barrier
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 430-450°F (221-232°C)
- Blow-Up Ratio: 2.5:1

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) ASTM Method under development. BYK-Gardner-Hazeguard utilized.
- (3) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (4) Heat Seal Strengths, Topwave HT Tester 0.5 S dwell, 40 psi bar pressure. Pulled on Instron tensiometer at 10 in./min (250 mm/sec).

-See "Handling Considerations" attached

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# AFFINITY PL 1280

## Polyolefin Plastomer

- Sealant in multi-layer cast films
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* PL 1280 Polyolefin Plastomer (POP) is produced via INSITE\* Technology from Dow

Plastics<sup>†</sup>. It is an ethylene alpha-olefin resin exhibiting excellent low

temperature seal initiation and excellent optics.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	6.0
Density, g/cc	ASTM D 792	0.9000
DSC Melting Point, °F (°C)	Dow Method	205 (96)
Vicat Softening Point, °F (°C)	ASTM D 1525	172 (78)
<b>Film Properties, 0.8 mil (20 µm)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	280 (23)
Energy, in·lbf (J)		28.6 (3.2)
Force, lbf (N)		7.8 (35)
Dart Impact (Method B), g	ASTM D 1709	>830
Elmendorf Tear <sup>(3)</sup> , g	MD	190
	CD	340
Tensile Yield, psi (MPa)	MD	1050 (7.2)
	CD	724 (5.0)
Ultimate Tensile, psi (MPa)	MD	5940 (41)
	CD	4200 (29)
Ultimate Elongation, %	MD	560
	CD	610
Tensile Modulus, 2% Secant, psi (MPa)	MD	14830 (102)
	CD	14780 (102)
Clarity	ASTM D 1746	71
Gloss, 20°	ASTM D 2457	140
Haze, %	ASTM D 1003	0.7

### Fabrication Conditions For Cast Film:

- Screw Size: 3.5 in. (89 mm); 32:1 L/D
- Screw Speed: 24 rpm
- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Speed: 9 rpm
- Screw Size: 2.0 in. (51 mm); 24:1 L/D
- Screw Speed: 41 rpm
- Screw Type: Sterlex, Single Flight with Maddock Mixer & Single Flight
- Die Gap: 20 mil (0.5 mm)
- Chill Roll Temperature: 70°F (21°C)
- Melt Temperature: 450-550°F (232-288°C)
- Output: 236 lb/hr
- Line Speed: 600 fpm (183 m/min)

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values not to be construed as specifications. Users should confirm results by their own tests.
- (3) Modified rectangular test specimen.

-See "Handling Considerations" attached



# AFFINITY PL 1840

## Polyolefin Plastomer for Sealant Films

- Outstanding low temperature sealability and toughness
  - Suitable as a sealant in liquid & dry food pouch applications
  - Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a.
- Consult the regulations for complete details.

AFFINITY\* PL 1840 Polyolefin Plastomer (POP) is produced via INSITE\* Technology from Dow Plastics†. It is an ethylene alpha-

olefin resin designed to provide blown film with low temperature sealability, good puncture resistance, optics and organoleptic

properties. It also has excellent compatibility with other polyolefins, allowing efficient blending and coextrusion.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.0
Density, g/cc	ASTM D 792	0.9090
DSC Melting Point, °F (°C)	Dow Method	222 (105.5)
Vicat Softening Point, °F (°C)	ASTM D 1525	203 (95)
<b>Film Properties, 2.0 mil (51 µm)</b>		
Puncture Resistance, ft-lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	304 (25)
Energy, in.-lbf (J)		81.1 (9)
Force, lbf (N)		20.9 (92)
Dart Impact (Method B), g	ASTM D 1709	>830
Elmendorf Tear <sup>(2)</sup> , g	MD	560
	CD	840
Tensile Yield, psi (MPa)	MD	1270 (8.8)
	CD	1170 (8.1)
Ultimate Tensile, psi (MPa)	MD	6930 (48)
	CD	6580 (45)
Ultimate Elongation, %	MD	620
	CD	580
Tensile Modulus, 2% Secant, psi (MPa)	MD	17800 (123)
	CD	17900 (123)
Clarity	ASTM D 1746	63
Gloss, 20°	ASTM D 2457	128
Haze, %	ASTM D 1003	2.5
Seal Initiation Temperature <sup>(3)(4)</sup> , °F (°C)	Dow Method	199 (93)

### Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Type: DSB11
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 429°F (220°C)
- Output: 6 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 40 rpm
- Frost Line Height: 25 in. (635 mm)

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) Modified rectangular test specimen.
- (3) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (4) Heat Seal Strengths, Topwave HT Tester 0.5 S dwell, 40 psi bar pressure, pull speed 10 in./min (250 mm/sec).

-See "Handling Considerations" attached

\*Trademark of The Dow Chemical Company

†Dow Plastics, a business group of The Dow Chemical Company and its subsidiaries

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# AFFINITY\* PL 1880

## Polyolefin Plastomer for Sealants in Multilayer Packaging

- Low seal initiation temperature
  - Excellent hot tack strength
  - High performance sealant layer in flexible packaging
  - Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a.
- Consult the regulations for complete details.

AFFINITY PL 1880 Polyolefin Plastomer (POP) sealants in Multilayer Packaging is produced via INSITE\* Technology from Dow Plastics<sup>†</sup>. It is an ethylene alpha-

olefin resin designed for use in a variety of demanding packaging applications, including high-speed, form-fill-seal packaging. This resin offers excellent ultimate hot tack

strength and low temperature seal initiation, even through contamination in the package.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.0
Density, g/cc	ASTM D 792	0.9020
DSC Melting Point, °F (°C)	Dow Method	210 (99)
Vicat Softening Point, °F (°C)	ASTM D 1525	187 (86)
<b>Film Properties, 2.0 mil (50 µm)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	270 (22)
Energy, in·lbf (J)		78 (8.6)
Force, lbf (N)		20.8 (94)
Dart Impact (Method B), g	ASTM D 1709	>830
Elmendorf Tear <sup>(2)</sup> , g	MD	550
	CD	720
Tensile Yield, psi (MPa)	MD	1050 (7.2)
	CD	1000 (6.9)
Ultimate Tensile, psi (MPa)	MD	8500 (58.6)
	CD	6480 (44.7)
Ultimate Elongation, %	MD	620
	CD	630
Tensile Modulus, 2% Secant, psi (MPa)	MD	13300 (91.7)
	CD	13400 (92.4)
Clarity	ASTM D 1746	83
Gloss, 20°	ASTM D 2457	141
Haze, %	ASTM D 1003	1.1
Seal Initiation Temperature <sup>(3)(4)</sup> , °F (°C)	Dow Method	185 (85)

### Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Type: SFDM
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 408°F (209°C)
- Output: 6 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 50 rpm
- Frost Line Height: 25 in. (635 mm)

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) Modified rectangular test specimen.
- (3) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (4) Heat Seal Strengths, Topwave HT Tester 0.5 S dwell, 40 psi bar pressure, pull speed 10 in./min (250 mm/sec).

-See "Handling Considerations" attached

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<sup>†</sup>Dow Plastics, a business group of The Dow Chemical Company and its subsidiaries

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# AFFINITY PL 1881

## Polyolefin Plastomer for Sealants in Multilayer Packaging

- Excellent ultimate hot tack strength
  - Low temperature sealability
  - Ability to seal through contamination
  - Outstanding optics
  - Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a.
- Consult the regulations for complete details.

Slip Additive: 750 ppm  
Antiblock Additive: 2500 ppm

AFFINITY\* PL 1881 Polyolefin  
Plastomer (POP) for sealants  
is produced via INSITE\*

Technology from Dow  
Plastics<sup>†</sup>. It is designed for a  
variety of demanding

packaging applications,  
including high-speed form-fill-  
seal products.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.0
Density, g/cc	ASTM D 792	0.9035
DSC Melting Point, °F (°C)	Dow Method	212 (100)
Vicat Softening Point, °F (°C)	ASTM D 1525	187 (86)
<b>Film Properties, 2.0 mil (50 µm)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	265 (22)
Energy, in·lbf (J)		71.6 (8.0)
Force, lbf (N)		18.5 (82)
Dart Impact (Method B), g	ASTM D 1709	>830
Elmendorf Tear <sup>(2)</sup> , g	MD	560
	CD	730
Tensile Yield, psi (MPa)	MD	1170 (8.1)
	CD	1040 (7.2)
Ultimate Tensile, psi (MPa)	MD	6580 (45)
	CD	6170 (43)
Ultimate Elongation, %	MD	585
	CD	630
Tensile Modulus, 2% Secant, psi (MPa)	MD	14120 (97)
	CD	14060 (97)
Clarity	ASTM D 1746	83
Gloss, 20°	ASTM D 2457	112
Haze, %	ASTM D 1003	3.2
Kinetic COF, (film/film)	ASTM 1894	0.15
Block force, g	ASTM D 3354-89	70
Seal Initiation Temperature <sup>(3)(4)</sup> , °F (°C)	Dow Method	185 (85)

### Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Type: DSB II
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 430°F (221°C)
- Output: 6 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 40 rpm
- Frost Line Height: 25 in. (635 mm)

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) Modified rectangular test specimen.
- (3) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (4) Heat Seal Strengths: Topwave HT Tester 0.5 S dwe; 40 psi bar pressure, pull speed 10 in./min (250 mm/sec).

-See "Handling Considerations" attached

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<sup>†</sup>Dow Plastics, a business group of The Dow Chemical Company and its subsidiaries.

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# AFFINITY PL 1888

## Polyolefin Plastomer for Packaging Films

- For use in monolayer films and as the sealant layer in multilayer films
- For fresh-cut produce, meat, cheese, and other high speed packaging applications requiring good machinability
- Fast processing on narrow die gaps
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a. Consult the regulations for complete details.

Slip Additive: 2000 ppm  
Antiblock Additive: 3000 ppm

AFFINITY\* PL 1888 Polyolefin Plastomer for Packaging films is used for high speed packaging applications requiring low seal initiation temperature and good

machinability (low consistent coefficient of friction and low block force). This resin is designed to give a COF of  $\leq 0.2$  for an  $\sim 1.0$  mil sealant layer in a coextruded film and

run fast and trouble-free on most extrusion equipment, including blown film dies equipped with narrow die gaps.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.00
Density, g/cc	ASTM D 792	0.9038
DSC Melting Point, °F (°C)	Dow Method	208 (98)
Vicat Softening Point, °F (°C)	ASTM D 1525	185 (85)
<b>Film Properties, 2.0 mil (51 <math>\mu</math>m)</b>		
Puncture Resistance, ft·lbf/in. <sup>3</sup> (J/cm <sup>3</sup> )	Dow Method	189 (16)
Energy, in·lbf (J)		53.0 (5.9)
Force, lbf (N)		15.1 (1.7)
Dart Impact (Method B), g	ASTM D 1709	>830
Elmendorf Tear, g	MD ASTM D 1922	432
	CD	720
Tensile Yield, psi (MPa)	MD ASTM D 882	858 (6)
	CD	868 (6)
Ultimate Tensile, psi (MPa)	MD ASTM D 882	7151 (49)
	CD	5772 (40)
Ultimate Elongation, %	MD ASTM D 882	604
	CD	573
Tensile Modulus, 2% Secant, psi (MPa)	MD ASTM D 882	10181 (70)
	CD	9963 (69)
Clarity	ASTM D 1746 <sup>(2)</sup>	95
Gloss, 45°	ASTM D 2457	81
Haze, %	ASTM D 1003	3.4
Kinetic COF (film/film)	ASTM D 1894	$\leq 0.2$
Seal Initiation Temperature <sup>(3)(4)</sup> , °F (°C)	Dow Method	176 (80)

### Fabrication Conditions For Blown Film:

- Screw Type: Modified LDPE or moderate-work barrier
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 430-450°F (221-232°C)
- Blow-Up Ratio: 2.5:1

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) ASTM Method under development. BYK-Gardner-Hazeguard Plus utilized.
- (3) Temperature at which 2 lb/in. (8.8 N/25.4 mm) heat seal strength is achieved.
- (4) Heat Seal Strengths, Topwave HT Tester 0.5 S dwell, 40 psi bar pressure. Pulled on Instron at 10 in./min. (250 mm/sec).

-See "Handling Considerations" attached



# AFFINITY PT 1409

## Polyolefin Plastomer for Extrusion Coated Packaging

- Monolayer and coextrusion coating and cast film for flexible packaging applications
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2a  
Consult the regulations for complete details

AFFINITY\* PT 1409 Polyolefin  
Plastomer (POP) is produced

via INSITE\* Technology from  
Dow Plastics<sup>†</sup>.

Physical Properties	Test Method	Values <sup>(1)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	6.0
Density, g/cc	ASTM D 792	0.911
DSC Melting Point, °F (°C)	Dow Method	226 (108)
Vicat Softening Point, °F (°C)	ASTM D 1525	196 (91)
<b>Extrusion Coating Processability<sup>(3)</sup></b>		
Recommended Melt Temperature, °F (°C)		550-610 (288-321)
Neck in @ 610°F and @ 1.0 mil, inches (mm)	Dow Method	45 (114)
Minimum Coating Weight, lb/ream (g/m <sup>2</sup> )	Dow Method	<3.8 (<6.3)
Minimum Coating Thickness, mil	Dow Method	<0.25

### Fabrication Conditions For Extrusion Coating Film:

- Screw Size: 3.5 in. (90 mm); 30:1 L/D
- Die Gap: 20 mil (.508 mm)
- Melt Temperature: 550°F (288°C)
- Output: 250 lb/hr

- (1) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (2) Tests performed on compression molded samples
- (3) Resin blended with 20 wt% LDPE to improve extrusion coating performance.

-See "Handling Considerations" attached

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<sup>†</sup>Dow Plastics a business group of The Dow Chemical Company and its subsidiaries

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# AFFINITY PT 1450

## Polyolefin Plastomer for Extrusion Coated Packaging

- Monolayer and coextrusion coating for packaging applications
- Recommended for use with Oriented Polypropylene (OPP as a tie layer or sealant)
- Coextruded with PRIMACOR\* polymer as a cost effective foil or PET sealant
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* PT 1450 Polyolefin Plastomer for extrusion coated packaging is produced via INSITE\* Technology from Dow Plastics†.

It is an ethylene alpha-olefin resin for monolayer and coextrusion coating that offers excellent low temperature seal initiation, ultimate

seal strength, adhesion to (OPP) and good taste and odor performance.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	7.5
Density, g/cc	ASTM D 792	0.9020
DSC Melting Point, °F (°C)	Dow Method	208 (98)
Vicat Softening Point, °F (°C)	ASTM D 1525	171 (77)
<b>Extrusion Coating Performance<sup>(3)</sup></b>		
Seal Initiation Temperature <sup>(4)(5)</sup> , °F (°C)	Dow Method	181 (83)
Adhesion to OPP @ 550°F lb/in.	Dow Method	1.04
@ 600°F lb/in.		0.73
<b>Extrusion Coating Processability</b>		
Recommended Melt Temperature, °F (°C)		550-600 (288-315)
Neck-in @ 600°F and @ 1.0 mil, inches (mm)	Dow Method	5.3 (135)
Minimum Coating Weight, lb/ream (g/m <sup>2</sup> )	Dow Method	<4.5 (<7.5)
Minimum Coating Thickness, mil	Dow Method	<0.3

### Fabrication Conditions For Extrusion Coating Film:

- Extruder: Black Clawson
- Screw Size: 3.5 in. (90 mm); 30:1 L/D
- Die Gap: 20 mil (0.508 mm)
- Chill Roll Temperature: 57°F (14°C)
- Melt Temperature: 600°F (315°C)
- Output: 250 lb/hr
- Air Gap: 6 in. (150 mm)

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests
- (3) 1.0 mil (25µm) coating onto 50 lb kraft paper
- (4) Temperature at which 1 lb/in. (4.4 N/25.4 mm) heat seal strength is achieved
- (5) Heat Seal Strengths, Topware HT Tester, 0.5 S dwell, 40 psi bar pressure, pull speed 150 mm/sec

-See "Handling Considerations" attached

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# AFFINITY SM 1300

## Polyolefin Plastomer for Injection Molding

- High clarity, durable injection molded parts
- Compression molded applications
- Excellent optics and flexibility
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

Slip Additive: 600 ppm

AFFINITY\* SM 1300 Polyolefin Plastomer (POP) for Injection Molding is produced via INSITE\* Technology from Dow Plastics\*.

This is an ethylene alpha-olefin resin that offers excellent performance in durable injection molded industrial and consumer

goods and compression molded closure liners or gaskets.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	30.0
Density, g/cc	ASTM D 792	0.9020
DSC Melting Point, °F (°C)	Dow Method	208 (98)
Vicat Softening Point, °F (°C)	ASTM D 1525	174 (79)
<b>Molded Part Properties<sup>(3)</sup></b>		
Tensile Yield <sup>(4)</sup> , psi (MPa)	ASTM D 638	598 (5)
Ultimate Tensile <sup>(4)</sup> , psi (MPa)	ASTM D 638	1326 (10)
Ultimate Elongation <sup>(4)</sup> , %	ASTM D 638	624
Notched Izod Impact	ASTM D 256	
@ -50°C, ft-lbf/in. (J/m)		1 (68)
@ -20°C, ft-lbf/in. (J/m)		9 (487)
@ 0°C, ft-lbf/in. (J/m)		5 (252)
@ 23°C, ft-lbf/in. (J/m)		4 (212)
Flexural Modulus, psi (MPa)	ASTM D 790	10,280 (71)
Modulus, 2% Secant, psi (MPa)	ASTM D 790	10,280 (71)

### Fabrication Conditions For Injection Molding:

- Molded using DEMAG 150
- Barrel Temperature<sup>(5)</sup>: 374°F (190°C)
- Chill Water Temperature: 55°F (13°C)
- Cycle Time: 20 seconds
- Fill Time: 1 second
- Hold Time: 5 seconds

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) Testing performed on injection molded ASTM test specimens (0.125 in.). Properties will vary with changes in molding conditions.
- (4) Crosshead speed 20 in./min.
- (5) Recommend do not exceed 550°F (288°C) barrel temperature.

-See "Handling Considerations" attached

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**Dow Plastics**

# AFFINITY VP 8770

## Polyolefin Plastomer for General Plastomeric Applications

- High elasticity with good elastic recovery
- Excellent impact strength in blends with polypropylene and polyethylene
- High clarity
- Complies with U.S. FDA 21 CFR 177.1520 (c) 3.2c.  
Consult the regulations for complete details.<sup>(1)</sup>

AFFINITY\* VP 8770 Polyolefin Plastomer for General Plastomeric Applications is produced via INSITE\* Technology from Dow Plastics\*. This is an

ethylene-octene copolymer exhibiting high flexibility and elasticity. It can be utilized in monolayer and coextruded films and in blends with other

polyolefins to enhance clarity, sealability and toughness of the structure.

Physical Properties	Test Method	Values <sup>(2)</sup> English (SI)
<b>Resin Properties</b>		
Melt Index, g/10 min	ASTM D 1238	1.00
Density, g/cc	ASTM D 792	0.8850
Mooney Viscosity, ML 1+4 @ 121°C	ASTM D 1646	27
Melt Flow Ratio, I <sub>10</sub> /I <sub>2</sub>	ASTM D 1238	7.5
DSC Melting Point, °F (°C)	Dow Method	180 (82)
Vicat Softening Point, °F (°C)	ASTM D 1525	140 (60)
<b>Mechanical Properties<sup>(3)</sup></b>		
Average Hardness, Shore A	ASTM D 2240	85
Tensile Strength at 100% elongation, psi (MPa)	ASTM D 638	1650 (11)
Tensile Yield, psi (MPa)	ASTM D 638	470 (3)
Ultimate Tensile, psi (MPa)	ASTM D 638	3200 (22)
Ultimate Elongation, %	ASTM D 638	>1000

- (1) It is the responsibility of the manufacturer of the food contact article to ensure the article is suitable for its intended use. Manufacturers should be aware that foods with a high oil content may compromise the integrity of the packaging.
- (2) Typical values, not to be construed as specifications. Users should confirm results by their own tests.
- (3) All tests performed on compression molded samples.

-See "Handling Considerations" attached

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# EXACT™ 8201

**ExxonMobil**  
Chemical

Plastomer for Polymer Modification

## Description

EXACT 8201 is an ethylene octene copolymer produced using ExxonMobil Chemical's EXXPOL™ Technology, exhibiting both plastic and elastomeric properties. This resin is designed for modification of both polypropylenes and polyethylenes in applications such as injection molding, extrusion blow molding, blown and cast film, and profile extrusion.

## Key Performance Attributes

- Premium low temperature impact modifier
- Free-flowing pellets
- High filler and oil acceptance
- High clarity and low fogging tendency
- Superior toughness and tear strength

Resin Properties		Test Based On	Units (SI)	Typical Values <sup>1</sup>
Melt Index		ExxonMobil Method	g/10 min	1.1
Melt Flow Rate		ExxonMobil Method	g/10 min	2.5
Density		ExxonMobil Method	g/cm <sup>3</sup>	0.882
Hardness <sup>2</sup> , 15 sec	Shore A	ASTM D-2240		78
	Shore D			27
Internal Haze <sup>2</sup>		ASTM D-1003	%	17 @ 40 mils
Physical Properties <sup>2</sup>				
Flexural Modulus, 1% secant		ASTM D-790	psi (MPa)	3810 (26.3)
Tensile Strength <sup>3</sup>	@ Break	ASTM D-638	psi (MPa)	No break
Elongation	@ Break	ASTM D-638	%	No break
Notched Izod	23°C	ASTM D-256	ft-lb/in (J/m)	No break
	-40°C			No break
Instrumented Impact <sup>4</sup>		ASTM D-3763	ft-lb (J)	12.1 (16.4) / 23 (31.2) 13.8 (18.4) / 24.7 (33.5)
Max Energy/Total Energy	23°C -40°C			
Elastomeric Properties <sup>2</sup>				
Mooney Viscosity ML (1+4)	125°C	ASTM D-1646	Torque Units	19
Tensile Stress <sup>5</sup>	@ 100% Elongation	ASTM D-412	psi (MPa)	484 (3.4)
	@ 300% Elongation			627 (4.3)
Tensile Strength	@ Peak	ASTM D-412	psi (MPa)	2910 (20.1)
Elongation	@ Break	ASTM D-412	%	750
Tear Strength, Die C		ASTM D-624	lb/in (kN/m)	300 (52.5)
Thermal Properties				
Peak Melting Temperature		ExxonMobil Method	°F (°C)	162 (66.7)
Vicat Softening Point <sup>2</sup>		ASTM D-1525	°F (°C)	133 (58.1)
Chemical Resistance Properties <sup>2</sup>				
Environmental Stress Crack Resistance		ASTM D-1693	hr	>1000
Condition A, F <sub>0</sub>				

1 Values are typical and should not be interpreted as specifications

2 Physical properties were measured on compression molded specimens

3 Tensile testing was conducted at a crosshead speed of 20 in/min

4 12.5 mm striker, 76 mm anvil span and 4 m/sec test speed

5 Elastomeric properties determined using specimens cut with a Type D die and a crosshead of 20 in/min

## FDA Status

EXACT 8201 complies with FDA regulation 21 CFR 177.1520 "Olefin polymers" paragraphs (a) (3) (i) (a) (4) and (c) 3.2 (c) and may be used as a component of materials or articles that contact food. Allowable conditions of use are hot filled and pasteurized (i.e., Conditions of use C through H described in 21 CFR 176.170 (c) Table 2). Contact is allowed with all types of foods, provided the finished article is technically suited for the intended use. Contact your ExxonMobil representative for additional information.

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**ExxonMobil**  
Chemical

# EXACT<sup>™</sup> 8203

Plastomer for Polymer Modification

## Description

EXACT 8203 is an ethylene octene copolymer produced using ExxonMobil Chemical's EXXPOL<sup>™</sup> Technology, exhibiting both plastic and elastomeric properties. This resin is designed for modification of both polypropylenes and polyethylenes in applications such as injection molding, cast film, and profile extrusion.

## Key Performance Attributes

- Premium low temperature impact modifier
- Free-flowing pellets
- High filler and oil acceptance
- High clarity and low fogging tendency
- Superior toughness, tear strength, and flexibility

Resin Properties		Test Based On	Units (SI)	Typical Values <sup>1</sup>
Melt Index		ASTM D-1238	g/10 min	3.0
Melt Flow Rate		ASTM D-1238	g/10 min	6.5
Density		ExxonMobil Method	g/cm <sup>3</sup>	0.882
Hardness <sup>2</sup> , 15 sec	Shore A	ASTM D-2240		80
	Shore D			30
Internal Haze <sup>2</sup>		ASTM D-1003	%	11 @ 50 mils
Physical Properties <sup>2</sup>				
Flexural Modulus, 1% secant		ASTM D-790	psi (MPa)	4104 (28.3)
Tensile Strength <sup>3</sup>	@ Break	ASTM D-638	psi (MPa)	No break
Elongation	@ Break	ASTM D-638	%	No break
Notched Izod	23°C	ASTM D-256	ft-lb/in (J/m)	No break
	-40°C			No break
Instrumented Impact <sup>4</sup>		ASTM D-3763	ft-lb (J)	13.4 (18.1) / 18.6 (25.2) 12.3 (16.7) / 21.7 (29.4)
Max Energy/Total Energy	23°C			
	-40°C			
Elastomeric Properties <sup>2</sup>				
Mooney Viscosity ML (1+4)	125°C	ASTM D-1646	Torque Units	11.5
Tensile Stress <sup>5</sup>	@ 100% Elongation	ASTM D-412	psi (MPa)	464 (3.2)
	@ 300% Elongation			580 (4.0)
Tensile Strength	@ Peak	ASTM D-412	psi (MPa)	No break
Elongation	@ Break	ASTM D-412	%	No break
Tear Strength, Die C		ASTM D-624	lb/in (kN/m)	247 (42.0)
Thermal Properties				
Peak Melting Temperature		ExxonMobil Method	°F (°C)	163.9 (73.3)
Vicat Softening Point <sup>2</sup> , 200g		ASTM D-1525	°F (°C)	163.0 (72.8)

1 Values are typical and should not be interpreted as specifications.

2 Physical properties were measured on compression molded specimens

3 Tensile testing was conducted at a crosshead speed of 20 in/min

4 12.5 mm striker, 76 mm anvil span and 3.3 m/sec test speed

5 Elastomeric tensile properties determined using specimens cut with a Type D die and a crosshead of 20 in/min.

## FDA Status

EXACT 8203 complies with FDA regulation 21 CFR 177.1520 "Olefin polymers" paragraph (c)3.2(c) and may be used as articles or components of articles intended for use in contact with food. Finished articles may contact all food types identified in Table 1 of CFR 176.170(c) only under Conditions of Use C through H described in Table 2 of 21 CFR 176.170(c), at temperatures up to hot-filled or pasteurized above 150 °F. Contact your ExxonMobil representative for additional information.

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# EXACT<sup>™</sup> 8210

Plastomer for Polymer Modification

**ExxonMobil**  
Chemical

## Description

EXACT 8210 is an ethylene octene copolymer produced using ExxonMobil Chemical's EXXPOL<sup>™</sup> Technology, exhibiting both plastic and elastomeric properties. This resin is designed for modification of both polypropylenes and polyethylenes in applications such as injection molding, cast film, and profile extrusion.

## Key Performance Attributes

- Premium low temperature impact modifier
- Free-flowing pellets
- High filler and oil acceptance
- High clarity and low fogging tendency
- Superior toughness, tear strength, and flexibility

Resin Properties		Test Based On	Units (SI)	Typical Values <sup>1</sup>
Melt Index		ASTM D-1238	g/10 min	10.0
Melt Flow Rate		ASTM D-1238	g/10 min	25
Density		ExxonMobil Method	g/cm <sup>3</sup>	0.882
Hardness <sup>2</sup> , 15 sec	Shore A	ASTM D-2240		79
	Shore D			27
Internal Haze <sup>2</sup>		ASTM D-1003	%	13 @ 50 mils

## Physical Properties<sup>2</sup>

Flexural Modulus, 1% secant		ASTM D-790	psi (MPa)	3807 (26.2 )
Tensile Strength <sup>3</sup>	@ Break	ASTM D-638	psi (MPa)	No break
Elongation	@ Break	ASTM D-638	%	No break
Notched Izod	23°C	ASTM D-256	ft-lb/in (J/m)	No break
	-40°C			No break
Instrumented Impact <sup>4</sup>		ASTM D-3763	ft-lb (J)	
Max Energy/Total Energy	23°C			9.2 (12.5) / 12.7 (17.2)
	-40°C	11.3 (15.3) / 19.1 (25.9)		

## Elastomeric Properties<sup>2</sup>

Mooney Viscosity ML (1+4)		125°C	ASTM D-1646	Torque Units	5.9
Tensile Stress <sup>5</sup>	@ 100% Elongation		ASTM D-412	psi (MPa)	407 (2.8)
	@ 300% Elongation				493 (3.4)
Tensile Strength		@ Peak	ASTM D-412	psi (MPa)	No break
Elongation		@ Break	ASTM D-412	%	No break
Tear Strength, Die C			ASTM D-624	lb/in (kN/m)	245.9 (43.1)

## Thermal Properties

Peak Melting Temperature	ExxonMobil Method	°F (°C)	164.7 (73.7)
Vicat Softening Point <sup>2</sup> , 200g	ASTM D-1525	°F (°C)	159.8 (71.0)

1 Values are typical and should not be interpreted as specifications.

2 Physical properties were measured on compression molded specimens

3 Tensile testing was conducted at a crosshead speed of 20 in/min

4 12.5 mm striker, 76 mm anvil span and 3.3 m/sec test speed

5 Elastomeric tensile properties determined using specimens cut with a Type D die and a crosshead of 20 in/min

## FDA Status

EXACT 8210 complies with FDA regulation 21 CFR 177.1520 "Olefin polymers" paragraph (c)3 2(c) and may be used as articles or components of articles intended for use in contact with food. Finished articles may contact all food types identified in Table 1 of CFR 176.170(c) only under Conditions of Use C through H described in Table 2 of 21 CFR 176.170(c), at temperatures up to hot-filled or pasteurized above 150 °F. Contact your ExxonMobil representative for additional information.

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